

# Combining Survey Choice Modeling with Customer Database Predictive Modeling

Case History

**Category:** *Utilities*

**Methods:** *Advanced Analytics, Customer Database Predictive Modeling, Hierarchical Bayes Choice Modeling*

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## Summary

Decision Analyst's client wished to directly predict the receptivity of its customers and prospects to a wide variety of promotion and pricing features of electricity plans. In particular, a very flexible prospect model was desired to use in targeting specific customers and prospects with specific offerings, based on demographic variables available within their customer database.



## Strategic Issues

As the client company offered a higher-priced product versus competitors, targeting and messaging attractive components of electricity plans were needed to improve customer retention and acquisition. As a large variety of plan structures with differing benefits were already being offered, tailoring and targeting of plan components to the individual customer was needed to effectively compete in the marketplace.

## Research Objectives

The objectives of the research included the following:

- Develop a model for a vast number of product configurations that predicts the propensity to buy (at the customer level).
- Develop a supplemental model to determine parameters of the predictive model for every customer and prospect within the client's customer database.
- Validate the final predictive model by measuring the lift of expected sales for a holdout sample of customers not included in model development.

## Research Design and Methods

Decision Analyst randomly selected a sample of the client's customer database to conduct an online survey questionnaire. Then the team designed a choice modeling exercise that was implemented within the survey.

The survey choice exercise was administered to roughly 1,000 respondents using *American Consumer Opinion*<sup>®</sup>, a proprietary, double opt-in panel of households that have agreed to participate in Internet surveys exclusively for Decision Analyst. The survey choice exercises focused on 6 attributes of electricity plans. The choice tasks were designed to closely reproduce the actual buying scenario as closely as possible. Respondents were shown 8 scenarios. Each scenario contained 4 possible pricing plans and the respondent was asked to choose a most preferred plan or "none of these."

Using the respondent choices from the survey, Hierarchical Bayes choice modeling was used to develop individual customer-level model parameters (utilities) for a variety of promotional and pricing elements of electricity plans. The Bayesian model simultaneously developed a scoring model that mathematically determined the customer's choice-model parameters as a function of geo-based demographics. The latter model was used to score the entire customer database of approximately *6 million records* with predicted choice-model parameters (utilities) at the customer level.

Decision Analyst used resulting database utilities to predict the propensity to buy a set of electricity plans from 8 different types among a holdout sample of customers, comparing actual with predicted purchase.

## Results

Five demographic variables were found to be most predictive of customer responsiveness to promotion and pricing features. The client's customer database was scored. Across 8 different types of electricity offerings, the predictive model *performed 1.9 times better than chance* with the top 20% of prospects.

Decision Analyst's client is now establishing upsell opportunities with current customers in order to identify underserved markets, to review the current product line, and to identify possible "white space" not currently covered within the market.